

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

providing said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

crystallizing said semiconductor film by heating;

irradiating the crystallized semiconductor film with laser light;

removing the metal from the crystallized semiconductor film by gettering after the irradiation of the laser light;

forming a semiconductor island having a tapered shape by patterning the crystallized semiconductor film, said tapered shape having an angle within a range of 20° to 50° between a side thereof and an underlying surface;

forming a first gate insulating film over the semiconductor island wherein the first gate insulating film comprises silicon oxide;

forming a second gate insulating film over the first gate insulating film wherein the second gate insulating film comprises silicon oxide nitride;

forming a gate electrode over the semiconductor island with the first gate insulating film and the second gate insulating film therebetween; and

forming at least a source region and a drain region in the semiconductor island.

2. (Canceled)

3. (Original) A method according to claim 1, wherein said patterning is performed by an isotropic dry etching method.

4.-61. (Canceled)

62. (Previously Presented) The method according to claim 1 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

63. (Previously Presented) The method according to claim 1 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

64. (Previously Presented) The method according to claim 1 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

65. (Previously Presented) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

providing said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

crystallizing said semiconductor film by heating;

irradiating the crystallized semiconductor film with laser light;

removing the metal from the crystallized semiconductor film by gettering after the irradiation of the laser light.

66. (Previously Presented) The method according to claim 65 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

67. (Previously Presented) The method according to claim 65 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

68. (Previously Presented) The method according to claim 65 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

69. (Previously Presented) A method for manufacturing a semiconductor device comprising:

- forming a semiconductor film comprising amorphous silicon on an insulating surface;

- providing a selected portion of said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

- crystallizing said semiconductor film by heating wherein crystallization proceeds from said selected portion in a lateral direction parallel to said insulating surface;

- irradiating the crystallized semiconductor film with laser light; and

- removing the metal from the crystallized semiconductor film by gettering after the irradiation of the laser light.

70. (Previously Presented) The method according to claim 69 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

71. (Previously Presented) The method according to claim 69 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

72. (Previously Presented) The method according to claim 69 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

73. (Previously Presented) A method for manufacturing a semiconductor device comprising:

- forming a semiconductor film comprising amorphous silicon on an insulating surface;

- providing a selected portion of said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

- crystallizing said semiconductor film by heating wherein crystallization proceeds from said selected portion in a lateral direction parallel to said insulating surface;

- irradiating the crystallized semiconductor film with laser light;

- removing the metal from the crystallized semiconductor film by gettering after the irradiation of the laser light;

- patterning the crystallized semiconductor film by etching to form a semiconductor island;

- forming a gate insulating film over the semiconductor island;

- forming a gate electrode over the gate insulating film; and

- forming source and drain regions in the semiconductor island.

74. (Previously Presented) The method according to claim 73 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

75. (Previously Presented) The method according to claim 73 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

76. (Previously Presented) The method according to claim 73 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

77. (Previously Presented) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

providing a selected portion of said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

crystallizing said semiconductor film by heating wherein crystallization proceeds from said selected portion in a lateral direction parallel to said insulating surface;

irradiating the crystallized semiconductor film with ultraviolet rays or infrared rays; and

removing the metal from the crystallized semiconductor film by gettering after the irradiation of the ultraviolet rays or infrared rays.

78. (Previously Presented) The method according to claim 77 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

79. (Previously Presented) The method according to claim 77 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

80. (Previously Presented) The method according to claim 77 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

81. (Previously Presented) A method for manufacturing a semiconductor device comprising:

- forming a semiconductor film comprising amorphous silicon on an insulating surface;

- providing a selected portion of said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

- crystallizing said semiconductor film by heating wherein crystallization proceeds from said selected portion in a lateral direction parallel to said insulating surface;

- irradiating the crystallized semiconductor film with ultraviolet rays or infrared rays;

- removing the metal from the crystallized semiconductor film by gettering after the irradiation of the ultraviolet rays or infrared rays;

- patterning the crystallized semiconductor film by etching to form a semiconductor island;

- forming a gate insulating film over the semiconductor island;

- forming a gate electrode over the gate insulating film; and

- forming source and drain regions in the semiconductor island.

82. (Previously Presented) The method according to claim 81 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

83. (Previously Presented) The method according to claim 81 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

84. (Previously Presented) The method according to claim 81 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

85. (Previously Presented) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

providing said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

crystallizing said semiconductor film by heating;

irradiating the crystallized semiconductor film with ultraviolet rays or infrared rays;

and

removing the metal from the crystallized semiconductor film by gettering after the irradiation of the ultraviolet rays or infrared rays.

86. (Previously Presented) The method according to claim 85 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

87. (Previously Presented) The method according to claim 85 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

88. (Previously Presented) The method according to claim 85 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

89. (Previously Presented) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

providing said semiconductor film with a metal containing material for promoting crystallization of said semiconductor film;

crystallizing said semiconductor film by heating;

irradiating the crystallized semiconductor film with ultraviolet rays or infrared rays;

removing the metal from the crystallized semiconductor film by gettering after the irradiation of the ultraviolet rays or infrared rays;

patterning the crystallized semiconductor film by etching to form a semiconductor island;

forming a gate insulating film over the semiconductor island;

forming a gate electrode over the gate insulating film; and

forming source and drain regions in the semiconductor island.

90. (Previously Presented) The method according to claim 89 wherein said metal is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

91. (Previously Presented) The method according to claim 89 wherein said gettering is performed by heating the crystallized semiconductor film in a halogen containing atmosphere.

92. (Previously Presented) The method according to claim 89 wherein a surface of the crystallized semiconductor film is oxidized when the gettering is performed.

93. (New) The method according to claim 1, wherein said irradiating step is performed to distribute the metal.

94. (New) The method according to claim 65, wherein said irradiating step is performed to distribute the metal.

95. (New) The method according to claim 69, wherein said irradiating step is performed to distribute the metal.

96. (New) The method according to claim 73, wherein said irradiating step is performed to distribute the metal.

97. (New) The method according to claim 77, wherein said irradiating step is performed to distribute the metal.

98. (New) The method according to claim 81, wherein said irradiating step is performed to distribute the metal.

99. (New) The method according to claim 85, wherein said irradiating step is performed to distribute the metal.

100. (New) The method according to claim 89, wherein said irradiating step is performed to distribute the metal.